other substances may be brought and saturated by means of the shoot leading from the manure tank pump, and, in inclement weather, men may be employed in turning, mixing, or drying ready for drill or general purposes. In fact, this may be the farmer's practical laboratory. There are hundreds of homesteads or farm yards in this country ill adapted for the warmth and well being of live stock. This view of the subject we see was confirmed at the meeting of the London Farmers' Club, June, 1851, that a covered yard was a necessary appendage. There perhaps may not be sufficient inducement for a yearly tenant to undertake and carry out modern improvements; but we believe, if he will refer to the models, he will see that some requisite alteration in his own yard could be easily contrived at a moderate outlay; and the profitable management that would accompany better arranged buildings would lead to still further improvements.

With an old inconvenient yard we should suggest that the bottom be put in order, if required, and made water-tight, hollow towards the centre, and that drains be laid on from the stable and stalls towards a tank for liquid manures."

As to cattle stalls he says:—

"The divisions or partitions between the stalls may be about five feet high and made either of post and rails only or close boarding. By this arrangement the stock may be seen at a view. Some agriculturists have adopted boarded floors for neat stock, similar to that in the piggery, or perforated; but this plan is not at present much used. It would require considerable outlay to adopt it for large farms. The owners of some of those which we have seen on this plan speak favourably of them, and one gentleman with whom we are acquainted has now fifty calves on lath boards. We saw them last year, just after their purchase and confinement; since which they have been well fed, and are now, the owner says, become quite little bullocks, still confined in the same department. Brick floors, or concrete, are more generally used: we suggest that open drains at the bottom of the neat cattle stalls, as commonly employed behind the animals, will add to their cleanliness. Our arrangements, it will be seen, secure warmth, for it is an acknowledged fact that animals produce more both of flesh and fat when kept in a state of repose, and at a moderate temperature than when exposed to cold. The water is easily supplied by pipes from the tank by taps which are placed in the stalls: each tap will supply two animals, a cistern being placed between their heads. It will be seen by the model that the preparation of food, &c., may be going on in all weathers with comfort to the work people."

The writer gives the following estimates of the cost of his arrangement:—

"For a building and yards, &c., &c., of about 200ft. long, 25ft. wide, and the walls 8ft. high above ground, with all the appurtenances connected therewith, 17s. per yard super; or, 7l. 1s. 3d. per yard run of 25ft. wide or width of the building. Cost of 200ft. at the above price, 472l. 4s. 6d.

For a ditto ditto, about 150ft. long, 25ft. wide, and walls 8ft., 17s. 3d. per yard super; or, 7l. 3s. 9d. per yard run, &c., &c. Cost of 150ft., at the above price, 359l. 7s. 6d.

For a ditto ditto, about 100ft. long, 25ft. wide, and walls 8ft., 17s. 6d. per yard super; or, 7l. 5s. 10d. per yard run, &c., &c. Cost of 100ft., at the above price, 243l. 1s. 1d.

The wide building would be the same per yard super, whether covered with slate or tiles, and if thatched still cheaper."

The advantages claimed by those who advocate concentrated farm-buildings are, saving of expense in the erection, and the husbanding of time and labour through the contiguity of the different buildings. One of its advocates says—"To accomplish the due economy of time and labour, the course of the provender from the straw and turnip house should, as far as possible, be in a straight line, and under cover, to save the loss of fodder passing from one house to another, and increase the servants' comfort;"—and others, such as infirmaries and poultry-houses, might either be advantageously erected separately, or at least might be omitted from the main buildings without causing inconvenience. The leading idea in the plan seems to be, placing the houses for horses and cattle in a central position, with the straw and turnip house at one end, and straight passages leading between the rows of beasts, to the manure-pit at the other. The position of the barn is determined by that of the house for containing fodder."

This concentrative system seems to us to have more defects than advantages, especially with respect to ventilation, and, with wooden roofs, the difficulty of preventing the destruction of the whole should any part take fire. Extension of such buildings, too, for increase of accommodation would be difficult.

Before designing a homestead the architect must make himself acquainted with the manner in which it is intended to farm the land, as the buildings must be different, we need scarcely say, for a stock farm than for one where grain is to be chiefly grown. If it be the former, one of the first questions he will have to consider is the system of feeding that should be pursued,—a point still in dispute. At a meeting of the "Farmers' Club" in June last, some contended for box-feeding, while others, and a majority, preferred a covered yard for the purpose. Others, again, prefer tying the cattle up in stalls. Each plan has its advantages under different circumstances, and these must be weighed by the farmer. In box-feeding the dung is not removed. According to the advocates of the system it becomes so much compressed (a daily supply of dry litter being given), that no sensible exhalation of effluvia takes place.

The author of the most recently published work on farm buildings, "A Treatise on the Arrangement and Construction of Agricultural Buildings, by John Ewart,"* inclines to box-feeding. He says—

"A box about 90 square feet of clear area, and 2 feet deep will contain the manure produced by a beast, having a sufficient supply of litter to keep it clean and dry, from the commencement of November to the end of February, and by increasing the depth an additional foot, it will hold the manure produced till the end of April. Eighty square feet for the clear area of a box is sufficient for a beast of the largest size: the dimensions may be varied from 9 to 11 feet from back to front, by a frontage breadth varying from 9 to 7 feet, as may be best adapted to the site on which a given number of boxes are required to be built. The depth should never exceed 3 feet, as beyond that depth it would be inconvenient, and not altogether unattended with danger to the animals in getting them in and out, until a considerable quantity of manure had accumulated in the boxes.

For the particular purpose of fattening, tying cattle up in stalls is undoubtedly less efficacious than keeping them singly in boxes of proper arrangement and construction. This inferiority is chiefly on account of the confinement being too rigid, and of incurring the labour consequent on the frequent removal of the dung. For milk cows, however, they being usually allowed moderate exercise during a portion of the day, stalls appear generally to be as well adapted as boxes, with the particular advantages of stalls over boxes in the more ready access to the animals for the purpose of milking, and of requiring much less space for the same number of cattle.

It is a well-ascertained fact that young cattle, from the time of their being weaned until they have advanced towards their full stature—which, in the breeds most distinguished for precocity, is not until they have completed the second year of their age—require freedom and exercise to attain the necessary growth of frame to fatten at an after period to the greatest advantage. To confine and attempt to fatten oxen by forced feeding, previous to their having nearly attained full growth, is apt to stop the developement of frame necessary to carry a great thickness of flesh; if such treatment be not even productive of absolute disease, from the shock the constitution of the animal is exposed to, by so violent an opposition to nature. The aim of the prudent rearer of cattle is to promote in his stock a continually progressive increase of frame and muscle without acquiring fat. To attain this object, the animals require at all times a plentiful supply of provender of good, but not too nutritive quality; considerable extent of freedom; and in winter, perfect, but not in any degree heating, shelter. These conditions will be best fulfilled by means of fold-yards provided with sheds."

We may here observe that Mr. Ewart's work contains a large amount of useful information, and is copiously illustrated with plans, elevations, and sections. He wisely cautions proprietors, nevertheless, against attempting to be their own architects, even with the assistance this and similar works will afford them.*

As to the box-feeding, we must own we have no great fondness for a system which involves the retention of decomposing matter under the noses of the beasts. On the same ground we look suspiciously on the boarded floors which have been introduced for sheep and pigs, with openings in them to allow the dung to fall through. It is quite right, however, that the evidence should be weighed. Mr. Mechi says, respecting the latter, as to sheep, "we were a good deal plagued at first, when we had narrow ¾-inch openings, having to sweep the floor, and the sheep got dirty; but now, with 1¼-inch openings, there is no trouble in any way, no expense of littering. The cost of boarding and labour, per superficial yard, of 9 feet, is as near as I can calculate, for sheep floors 4s. 2d. to 4s. 6d.; for the bullock, ditto, about the same. Bricked, and cemented tank under it, about 2s. per superficial yard."

A proper supply of water (at smallest possible cost) is an important matter. An examination will often show that water will bring itself from higher parts of the farm if a course be provided for it.

It is important that all the roofs should have guttering, with pipes to bring the rain water into tanks if needed, or drains if not. When this is not attended to, the yards are made sloppy, and the manure in open courts injured. These courts, by the way, or cattle yards, may be sunk a foot below the surface level, and should have drains to a liquid manure tank, at a point, say 9 inches above the bottom, so as to leave a certain quantity of moisture for the decomposition of the litter. Good roads save money: a railroad, or tramway, may always be introduced with advantage round and through a farm: a steam-engine will prove a good investment of the money it costs, in a farm of more than 500 acres, perhaps less. The barn and granary need not be so large as

* London, 1851. Longman, Brown, and Co.; Edinburgh, Oliver; Newcastle-upon-Tyne, Lambert.

* We mentioned some time ago, with recommendation, Mr. Dean's "Essays on the Construction of Farm Buildings," and his "Land Steward." The Royal Agricultural Society's "Journal" will be found to contain some valuable essays on the subject; and in London's "Encyclopædia of Cottage and Farm Architecture," although change of views has made some of the opinions obsolete, there will be found a large amount of available information.

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